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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Nicholas P. Wilt et al.

Patent No.: 6,954,214

Issue Date: Oct. 11, 2005

Customer No.: 22971

Examiner: Harrison, Chante E

Group Art Unit: 2675

Confirmation No.: 6694

Docket No: 155514.02

Title: EFFICIENT PERCEPTUAL/PHYSICAL COLOR SPACE CONVERSION

Attn: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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X   Authorization to charge the Certificate of Correction fee of $100.00 to the Deposit Account No. **50-0463.**

X   Request for Certificate of Correction (1 pg.).

X   Certificate of Correction Form - PTO-1050 (6 pgs.).

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Customer Number: 22971

By: /Sung T. Kim/
Attorney Name: Sung T. Kim
Reg. No.: 45,398

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Certificate of Correction Branch, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450, on this 29th day of July 2009.

Christine Hartness

IN UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Nicholas P. Wilt et al.   Examiner: Harrison, Chante E

Patent No.: 6,954,214   Group Art Unit: 2675

Issue Date: Oct. 11, 2005   Confirmation No.: 6694

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Title: EFFICIENT PERCEPTUAL/PHYSICAL COLOR SPACE CONVERSION

[stamp: AUG 03 2009 — U.S. PATENT & TRADEMARK OFFICE]

REQUEST FOR CERTIFICATION OF CORRECTION

Attn: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. Two copies of the text of the Certificate in the suggested form are enclosed.

Pursuant to 1.20(a), the examiner is authorized to charge the Certificate of Correction fee of $100.00 to the Deposit Account No. **50-0463.**

Issuance of the Certificate of Correction would neither expand nor contract the scope of the claims as properly allowed, and re-examination is not required.

The Examiner is authorized to charge any additional fees or credit overpayment to Deposit Account No. **50-0463.**

Respectfully submitted,

Customer Number: 22971

Date: May 28, 2009   By: /Sung T. Kim/
                            Attorney Name: Sung T. Kim
                            Reg. No.: 45,398

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Certificate of Correction Branch, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450, on this 29th day of July 2009.

Christine Hartness

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO   : 6,954,214

DATED   : Oct. 11, 2005

INVENTOR(S)   : Wilt, et al.

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the face page, in field (56), in "Other Publications", in column 2, line 12, after "229–299" insert - - (1997) - -.

On Sheet 4 of 9, in FIG. 4, please replace "FIG. 4" with the following figure.

FIG. 4


```
310 —

         extern "C" void
         LinearTosRGBColor( Color *pOut, Color *pIn )
         {
             // liner approximation that avoids taking 3 successive
             // square roots: apply one round of N-R to guess cube
             // root of x*sqrt(sqrt(x))
             for ( int i = 0; i < 4; i++)
             {
                 float x = (*pIn)[i];

                 float sqrtx = sqrtf(x);
                 float sqrt2x = sqrtf(sqrtx);
                 float appx = 0.78f*sqrtx+0.22f*sqrt2x;
                 float num = x*sqrt2x;
                 float cuberoot = (2*appx+(x*sqrt2x)/(appx*appx))/3.0f - 0.00025f;
                 if ( x < 0.00304f )
                     x = 12.92f * x;
                 else
                     x = 1.055f*cuberoot-0.055f;
                 (*pOut)[i] = x;
             }
         }
```

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO   : 6,954,214

DATED   : Oct. 11, 2005

INVENTOR(S)   : Wilt, et al.

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Sheet 5 of 9, in FIG. 5, please replace "FIG. 5" with the following figure.

FIG. 5

400 —

```
const __declspec(align(16)) __m128 Const039 = _mm_set1_ps(
0.03928f );

const __declspec(align(16)) __m128 ConstInv1292 = _mm_set1_ps(
1.0f/12.92f );

const __declspec(align(16)) __m128 Const055 = _mm_set1_ps( 0.055f
);

const __declspec(align(16)) __m128 ConstInv1055 = _mm_set1_ps(
1.0f/1.055f );

const __declspec(align(16)) __m128 Const1285 = _mm_set1_ps(
1.285f );

const __declspec(align(16)) __m128 Const0285 = _mm_set1_ps(
0.285f );
```

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO   : 6,954,214

DATED   : Oct. 11, 2005

INVENTOR(S)   : Wilt, et al.

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Sheet 6 of 9, in FIG. 6, please replace "FIG. 6" with the following figure.

401

FIG. 6

```
extern "C" void
sRGBColor( Color *pOut, Color *pIn )
{
    // SIMD: compute BOTH answers and compose output using mask
    __m128 ansBelowDelta = _mm_mul_ps( *(__m128 *) pIn, ConstInv1292 );
    __m128 x = _mm_mul_ps( ConstInv1055, _mm_add_ps( *(__m128 *) pIn,
Const055 ) );
    __m128 sqrx = _mm_mul_ps( x, x );
    __m128 invsqrx = _mm_rcp_ps( sqrx );
    __m128 invsqrtx = _mm_rsqrt_ps( x );
    __m128 ansAboveDelta = _mm_div_ps( Const1285,
            _mm_mul_ps( invsqrx, _mm_add_ps( Const0285, invsqrtx ) ) );
    __m128 TrueIfLTDelta = _mm_cmplt_ps( *(__m128 *) pIn, Const039 );
    *(__m128 *) pOut = _mm_or_ps( _mm_and_ps( TrueIfLTDelta, ansBelowDelta
),
            _mm_andnot_ps( TrueIfLTDelta, ansAboveDelta ) );
}
```

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO   : 6,954,214

DATED   : Oct. 11, 2005

INVENTOR(S)   : Wilt, et al.

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Sheet 7 of 9, in FIG. 7, please replace "FIG. 7" with the following figure.

500

FIG. 7

```
const __declspec(align(16)) __m128 CONST00304 = _mm_set1_ps( 0.00304f );
const __declspec(align(16)) __m128 CONST1292 = _mm_set1_ps( 12.92f );
const __declspec(align(16)) __m128 CONST055 = _mm_set1_ps( 0.055f );
const __declspec(align(16)) __m128 CONST1055 = _mm_set1_ps( 1.055f );

const __declspec(align(16)) __m128 CONST078 = _mm_set1_ps( 0.78f );
const __declspec(align(16)) __m128 CONST1m078 = _mm_set1_ps( 1.0f-0.78f );

const __declspec(align(16)) __m128 CONST38 = _mm_set1_ps( 0.38f );
const __declspec(align(16)) __m128 CONST1m38 = _mm_set1_ps( 1.0f-0.38f );

extern "C" void
LinearTosRGBColor( Color *pOut, Color *pIn )
{
    __m128 ansBelowDelta = _mm_mul_ps( *(__m128 *) pIn, CONST1292 );
    __m128 sqrtx = _mm_sqrt_ps( *(__m128 *) pIn );
    __m128 sqrt3x = _mm_sqrt_ps( _mm_sqrt_ps( sqrtx ) );
    __m128 pow124 = _mm_add_ps( _mm_mul_ps( CONST38, sqrtx ),
                    _mm_div_ps( _mm_mul_ps( CONST1m38, sqrtx ), sqrt3x ) );
    __m128 ansAboveDelta = _mm_sub_ps( _mm_mul_ps( CONST1055, pow124 ), CONST055 );
    __m128 TrueIfLTDelta = _mm_cmplt_ps( *(__m128 *) pIn, CONST00304 );
    *(__m128 *) pOut = _mm_or_ps( _mm_and_ps( TrueIfLTDelta, ansBelowDelta ),
                    _mm_andnot_ps( TrueIfLTDelta, ansAboveDelta ) );
}
```

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO   : 6,954,214

DATED   : Oct. 11, 2005

INVENTOR(S)   : Wilt, et al.

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On Sheet 8 of 9, in FIG. 8, please replace "FIG. 8" with the following figure.

500

FIG. 8

```
const __declspec(align(16)) __m128 Magic00304 = _mm_set1_ps( 0.00304f );
const __declspec(align(16)) __m128 Magic1292 = _mm_set1_ps( 12.92f );
const __declspec(align(16)) __m128 Magic055 = _mm_set1_ps( 0.055f );
const __declspec(align(16)) __m128 Magic1055 = _mm_set1_ps( 1.055f );
const __declspec(align(16)) __m128 MagicInv3 = _mm_set1_ps( 1.0f/3.0f );
const __declspec(align(16)) __m128 MagicFudge = _mm_set1_ps( 0.00025f );

const __declspec(align(16)) __m128 Magic078 = _mm_set1_ps( 0.78f );
const __declspec(align(16)) __m128 Magic1m078 = _mm_set1_ps( 1.0f-0.78f );

const __declspec(align(16)) __m128 Magic38 = _mm_set1_ps( 0.38f );
const __declspec(align(16)) __m128 Magic1m38 = _mm_set1_ps( 1.0f-0.38f );

extern "C" void
LinearTosRGBColor( Color *pOut, Color *pIn )
{
    __m128 ansBelowDelta = _mm_mul_ps( *(__m128 *) pIn, Magic1292 );
    __m128 sqrtx = _mm_sqrt_ps( *(__m128 *) pIn );
    __m128 sqrt2x = _mm_sqrt_ps( sqrtx );
    __m128 appx = _mm_add_ps( _mm_mul_ps( Magic078, sqrtx ),
                    _mm_mul_ps( Magic1m078, sqrt2x ) );
    __m128 cuberoot = _mm_sub_ps(
                _mm_mul_ps( MagicInv3,
                _mm_add_ps( _mm_add_ps( appx, appx ),
                    _mm_div_ps( _mm_mul_ps( *(__m128 *) pIn, sqrt2x ),
                    _mm_mul_ps( appx, appx )
                    )
                )
            ), MagicFudge
        );
    __m128 ansAboveDelta = _mm_sub_ps( _mm_mul_ps( Magic1055, cuberoot ), Magic055 );
    __m128 TrueIfLTDelta = _mm_cmplt_ps( *(__m128 *) pIn, Magic00304 );
    *(__m128 *) pOut = _mm_or_ps( _mm_and_ps( TrueIfLTDelta, ansBelowDelta ),
                    _mm_andnot_ps( TrueIfLTDelta, ansAboveDelta ) );
}
```

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CERTIFICATE OF CORRECTION

PATENT NO   : 6,954,214

DATED   : Oct. 11, 2005

INVENTOR(S)   : Wilt, et al.

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 3, line 5, delete "modern" and insert - - modem - -, therefor.

In column 3, line 32, delete "$x^{1/24}$" and insert - - $x^{1/2.4}$ - -, therefor.

In column 6, line 63, delete "$X^{1/2.4} = \sqrt[3]{\sqrt{X^{1.25}}}$" and insert - - $x^{\frac{1}{2.4}} = \sqrt[3]{x^{1.25}}$ - -, therefor.

In column 6, line 64, after "which" insert - - can be - -.

In column 8, line 1, delete "x^{05}" and insert - - $x^{0.5}$ - -, therefor.

In column 8, line 40, delete "un-altered" and insert - - unaltered - -, therefor.

In column 12, line 6, in Claim 8, after "having" delete "in" and insert - - an - -, therefor.

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